

INFILTRATED ALUMINUM PREFORMS

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ABSTRACT

A method for the manufacture of a three-dimensional object includes the steps of forming a mixture that contains a binder and a least one of aluminum or a first aluminum-base alloy into a green composite, removing the binder from said green composite, forming a porous perform structure, reacting the aluminum or first aluminum base alloy with nitrogen to form a rigid and continuous skeleton and infiltrating the porous structure with molten aluminum or second aluminum base alloy to form the three-dimensional object with near theoretical density. The green composite may be formed by an additive process such as computer aided rapid prototyping, for example, selective laser sintering. The method facilitates the rapid manufacture of aluminum components by an inexpensive technique that provides high dimensional stability and high density.